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14. ABSTRACT

The primary research aims are to examine the early longitudinal course of PTSD symptoms and test hypotheses regarding risk factors for chronic PTSD in military personnel returning from Iraq or Afghanistan. To date, 238 subjects have completed baseline interviews; 6, 12, and 24 month interviews have been completed for 177, 131, and 62 participants respectively. Data processing is continuing. Of 179 participants with processed data, 13% met full criteria for PTSD; 40% reported 3 or more symptoms of PTSD at month one post-deployment. Symptoms of hyperarousal were the most common. Total scores from the Clinician Assessment of PTSD Scale (CAPS) decreased significantly from month one to month 6 post-deployment. 18% had a current diagnosis of a mood disorder, and 9% had current alcohol abuse or dependence. PTSD symptom clusters of numbing / avoidance and hyperarousal were significantly associated with psychosocial impairment, controlling for the presence of other Axis I disorders. Psychosocial variables showing significant associations with PTSD included pre-deployment trauma, severity of warzone trauma exposure, several features of the deployment environment, lower post-deployment social support, and higher post-deployment life stress. Further assessments and data processing will continue over the next 3 months, and data analyses will be conducted to address the specific hypotheses on the fuller sample.

15. SUBJECT TERMS
Posttraumatic Stress Disorder, mental health, longitudinal research

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Introduction: The purpose of this first phase of longitudinal research is to examine the early longitudinal course of PTSD in military personnel after their return from Iraq or Afghanistan, and to test hypotheses regarding risk factors for chronic PTSD. The study aims to recruit and comprehensively assess 300 National Guard and Reserve troops recently returning from deployment, and to obtain follow-up assessments of symptomatic course, functional outcomes, treatment utilization, and ongoing social support and life stress at 6, 12, and 24 months post return.

Body: The response to the study has been excellent in terms of command support (willingness to allow us to speak to the soldiers to present the study) and in terms of the interest and response among soldiers. Recruitment efforts focused on post-deployment health assessments and reassessments held by the Rhode Island National Guard (RING).

As of 8/05/09, 238 participants agreed to participate, signed informed consent, and completed baseline interviews (Task 1). This represents 79% of our goal of 300. Six month and 12 month follow-up assessments have been completed for 177 and 131 participants, respectively (Task 2). We are extending the work of the study (unfunded) for a period of about 5 months to increase our follow-up interviews (Task 2) and to complete data entry, verification and editing (Task 3a). We project completing 200 six month and 165 12 month interviews. Beyond the original tasks, we conducted 24 month interviews for eligible participants (i.e. within 2 years of return from deployment) for 62 participants to date, and project completing up to 80 by the end of October.

Preliminary analyses have been conducted using fully processed data from the initial interview for 179 participants, 6 month data for 124 participants, and 12 month data for 99 participants (Task 3b and 3c). We provide a summary of these preliminary findings in the following and in the appendix. Data analysis and manuscript writing will continue.

Current sample

The majority of participants recruited to date served in the Rhode Island National Guard (RING), and were recruited directly from the military units following return from deployment in Iraq. Our study sample is nearly identical to the total (RING) in terms in proportion of Caucasians (90% vs 90%), proportion of African American and other minorities (11% vs 10.1%) and mean age (33.6 vs 33).

Traumatic Exposure in the War-Zone

Data on trauma exposure during the most recent deployment, assessed by the Combat Experiences Scale (3) showed that the majority (93%) reported being in serious danger at least once (78% were in serious danger many times). Rates of exposure were lower for participants recruited over the past year or so, reflecting the decrease in violence in Iraq. Participants were exposed to a range of life-threatening or other potentially traumatic experiences (table 1).

Table 1: Rates of War Zone Trauma Exposure	N=152

Combat Experiences Scale	
Attacked or ambushed	62%
Small arms fire	71%
Clearing homes / bldgs	37%
IED/booby trap exploded nearby	67%
Seeing dead bodies / remains	67%
Handling / uncovering human remains	25%
Knowing someone injured or killed	62%
Seeing dead / seriously injured Americans	48%
Member of unit casualty	34%
Witnessing accident (injury or death)	38%
Responsible for death of enemy	13%
Responsible for death of non-combatant	2%

Baseline data: PTSD Diagnosis and Symptoms Based on the Clinician-Administered PTSD Scale (CAPS), 23 (13%) of the 179 subjects met full criteria for PTSD related to deployment experiences during the first month post-deployment. An additional 11 had previously met criteria for PTSD following an earlier deployment, which was not current at the time of the initial study assessment. Reflecting the decrease in amount of exposure to traumatic events, the overall rate of current PTSD is lower than the 17% reported in our last progress report, based on the first 100 participants. Most subjects reported some clinically significant symptoms -- 80% had at least one deployment related PTSD symptom (moderate or worse severity), 40% had at least 3, and 32% had 5 or more. Symptoms of hyperarousal were the most frequent (Table 2), particularly hypervigilance (54%), exaggerated startle (46%), difficulty falling or staying asleep (44%), and irritability and anger (45%). In terms of PTSD symptom clusters, 76% of subjects reported one or more symptoms from the hyperarousal (D) symptom cluster, 39% endorsed one or more re-experiencing (B) symptoms, and 45% endorsed one or more Avoidance (C) symptoms.

Difficulty concentrating	20%
Table 2. Baseline PTSD Symptoms N=179	
Re-experiencing (B) Symptoms	46%
Intrusive recollections	14%
Distressing dreams	17%
Flashbacks	12%
Psychological distress related to cues	18%
Physiological distress related to cues	15%
Avoidance (C) Symptoms	
Avoid thoughts, feelings	20%
Avoid places, people	12%
Unable to recall aspects of trauma	9%
Loss of interest	15%
Detached / estranged from others	16%
Restricted range of emotion	18%
Foreshortened future	3%
Hyperarousal (D) Symptoms	
Difficulty falling or staying asleep	44%
Irritability and Anger	45%

***Other Axis I Disorders*:** The most frequent Axis I diagnoses beside PTSD were Major Depressive Disorder (MDD) and Alcohol abuse or dependence. 11% had current MDD at baseline, and an additional 16% had prior MDD. The rates for any mood disorder were 18% current and 18% past. 4% reported current alcohol abuse, 5% current alcohol dependence; 31% reported a history (not current) of alcohol abuse or dependence. Drug abuse or dependence, largely overlapping with the alcohol problems sample, was present in 2% (current) and 16% (past). Anxiety disorders other than PTSD were present in 7% (current), with 4% reporting past

anxiety disorders.

***Psychosocial Impairment*:** Both the diagnosis and symptom severity of PTSD were significantly associated with impairment in psychosocial functioning. The mean score on the Global Assessment Scale (GAF) was 48.0 (± 5.7) for those with PTSD, compared to 61.7 (± 10.0) for those without PTSD ($t = 8.27$, $p < .0001$). Those with PTSD also had significantly poorer adjustment on the LIFE global social adjustment, recreation, and life satisfaction scales. Correlations of symptom severity from the CAPS were significant for the GAF ($r = -.69$), global social adjustment ($r = .54$), friends ($r = .22$), satisfaction ($r = .42$), and recreation ($r = .52$). PTSD symptom severity also predicted functioning controlling for the presence of other Axis I disorders. Of the PTSD symptom clusters, numbing / avoidance symptoms were the strongest and most consistent predictors of social functioning, and hyperarousal symptoms were the strongest predictors of overall severity and distress. (see Appendix).

***Follow-up Data: PTSD Diagnosis and Symptoms*:** Of the 124 subjects with processed data available over the first 6 months post-deployment, 18 had deployment-related PTSD at month 1 post-deployment. Five of the 18 (28%) did not meet PTSD criteria at 6 months. Of 99 subjects with 12 month data available, 11 had PTSD at baseline; five of the eleven (45%) no longer met criteria at 12 months. Three participants without PTSD at month 1 post-deployment had a first onset of PTSD by 6 months; and additional 2 had a first onset between 6 and 12 months. In total, 39 participants (22% of the 179) had a current or past history of deployment related PTSD based on available data.

Overall, the mean level of symptom frequency and severity, as measure by the CAPS total score, decreased from 24.9 (22.3) to 22.1 (22.6) from month 1 to month 6 post-deployment ($t=3.1$, $p=.002$). However, individual symptoms of PTSD showed varying rates of remission over 6 months. Flashbacks, startle response, and restricted range of affect had the highest rates of remission (35%, 30%, and 29% respectively). Anger was the most persisting symptom, with only 6 of 60 subjects (10%) with this symptom losing it by 6 months. There were also new onsets of symptoms. Irritability / anger had the highest rate of new onset (13% of those without it at baseline were positive at 6 months). Thus, symptoms were diminishing for some participants, but increasing for others. Hyperarousal symptoms including difficulty sleeping, irritability and anger, hypervigilance, and startle response continued to have the highest rates at 6 and 12 months post-deployment.

***Follow-up Data: Other Axis I Disorders*:** There were 2 new onsets of alcohol abuse, 4 new onsets of major depressive disorder, and 10 new onsets of depression not otherwise specified by 6 months (i.e. not present at month one, present by month 6).

***Mental Health Treatment*:** Of 124 subjects with available data, 44 (35 %) received some form of outpatient mental health treatment within the first six months following their return. This percent is very close to reports from large samples of OIF soldiers (Hoge et al., JAMA, 2006). Most ($n = 33$) received individual treatment with or without medication; 21 received medication.

Psychosocial correlates of PTSD diagnosis and symptoms

Demographic Variables***:*** Analyses of demographic variables showed only level of education (lower) to be associated with PTSD (X^2 = (3) 9.6, p = .02). Age, race or ethnicity, and marital status were not related.

Pre-deployment variables: Consistent with prior research, the pre-deployment life events / trauma scale from the DRRI was significantly correlated with the CAPS total score (r=.23, p < .01).

Deployment-Related -- War-Zone Trauma and Contextual Factors**:** Severity of trauma exposure was a strong predictor of PTSD in terms of diagnosis and number of symptoms. Mean scores and standard deviations of items from the Hoge Combat Experiences Scale (possible range of 0-52) were 20.8 (9.4) and 11.1 (9.7) for those with and without PTSD, respectively (t = 3.79, p <.0001). The Hoge Scale score was also significantly correlated with the CAPS total score (r = .48, p < .0001). Of note is that among the 35 participants with at least one prior deployment to Iraq, the rate of current PTSD at month one was 26%, compared to 10% among those returning from their first deployment. Deployment related scales from the Deployment Risk and Resiliency Inventory (DRRI) significantly correlated with the CAPS total score included deployment environment (r = .48, p <.0001), life and family concerns (r = .34, p < .0001), unit support (r = -.19, p < .05), relationships within unit (r = .28, p < .01), deployment concerns (perceived threat, safety) (r=.47, p < .0001), and exposure to nuclear, biological, chemical agents (r =.44, p < .0001).

Post-Deployment: The CAPS score was significantly associated with the DRRI scales of postdeployment social support (r = -40, p < .0001) and life events (r =.45, p<.0001).

Over the past year, we continued to recruit for the add-one study funded by the USAMRMC to collect data for genetic and stress hormone (cortisol) factors as risk factors (Audrey Tyrka, M.D. Principle Investigator). Recruitment for the add-on study began about 6 months after the main study. Response has been excellent with the majority of participants agreeing to participate.

These preliminary analyses support several of our hypotheses, including 1) at least 50% of those with PTSD will show a persisting pattern; 2) symptoms of hyperarousal will be the most persistent of the 3 symptom clusters; 3) risk factors for PTSD include severity of war-zone trauma, predeployment stress / trauma, lower levels of social support and higher levels of life stress post-deployment.

Limitations include the preliminary nature of these analyses, based on a smaller sample than projected. Although funding for the study has ended, as noted we are continuing follow-up interviews through October 2009, and anticipate completion of up to 200 6 month, 165 12 month, and 90 24 month interviews. We anticipate that data processing will be completed by the end of November, 2009 for the interviews conducted by the end of October (Task 3a). Data analyses and manuscript writing (Task 3 b-c) will continue until the major findings are reported. These will also include analyses of cortisol and

genetics in collaboration with Dr. Tyrka. We are pursuing funding opportunities to increase the sample and complete follow-up through at least 24 months for the full sample.

Key Research Accomplishments:

- Preliminary findings of persistence and remission of symptoms of PTSD in the early post-deployment period in this sample consisting predominantly of National Guard soldiers.
- Findings related to presence of additional Axis I disorders and psychosocial impairment.
- Findings of different patterns of associations between PTSD symptom clusters and areas of functioning.
- Preliminary findings of associations between several hypothesized risk factors and PTSD.

Reportable Outcomes:

Manuscripts: Shea MT, Vujanovic AA, Mansfield AK, Sevin E, & Liu F. Functional Impairment among OEF/OIF Veterans: Associations with PTSD symptoms (see Appendix). Under review (revise and resubmit).

Presentations:

- Shea MT et al. Impairment among OEF/OIF Veterans: Associations with PTSD symptoms. Accepted for presentation, ISTSS annual meeting, November 2009.

Conclusion:

Although these findings are preliminary, they are consistent with many of the hypotheses. Further analyses, including model testing incorporating genetics and cortisol data, will be conducted with the larger sample and increased number of follow-up interviews in late 2009 and 2010. The study design provides several advantages, including rigorous assessment of PTSD symptoms and additional Axis I disorders using validated structured clinical interviews, systematic assessment of the course of all PTSD symptoms and of additional Axis I disorders, comprehensive assessment of psychosocial impairment and of all treatments received, and assessment of key psychosocial and biological variables postulated to increase risk for onset and maintenance of PTSD. Findings from this study should increase the ability to identify those at higher risk for long term problems with PTSD, critical to targeting early interventions.

References:

Hoge CW, Auchterlonie JL, & Milliken CS. Mental health problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. Journal of the American Medical Association, 2006, 295: 1023-103.

Appendices:

(1) Shea MT, Vujanovic AA, Mansfield AK, Sevin E, & Liu F. Functional Impairment among OEF/OIF Veterans: Associations with PTSD symptoms.

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Functional Impairment among OEF/OIF Veterans: Associations with PTSD symptoms

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Abstract

The aims of the present investigation were first, to examine associations between PTSD (diagnosis and symptoms) and different aspects of functioning and other quality of life variables among OIF / OEF veterans, and second, to examine the unique contribution of PTSD symptom clusters to different aspects of functioning and distress. Participants were 124 veterans who had returned from war-zone deployment and had assessments covering a minimum of 6 months following their return. PTSD (diagnosis and symptoms) were significantly associated with nearly all of the psychosocial functioning and distress measures. Of the PTSD symptom clusters, numbing / avoidance symptoms were the strongest and most consistent predictors of social functioning, and hyperarousal symptoms were the strongest predictors of overall severity and distress.

In addition to death and physical injury, the cost of war includes a large mental health and public health burden. Posttraumatic stress disorder (PTSD) is one such burden. Among U.S. war veterans, prevalence rates of PTSD are high (American Psychiatric Association, 2000; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Estimates of lifetime PTSD among male Vietnam veterans from the National Vietnam Veterans' Readjustment Study (NVVRS; Kulka, 1990) range from 18.7% to 31% (Dohrenwend et al., 2006), depending on the stringency of the method used to assess PTSD. Reported estimates of PTSD among veterans of the wars in Iraq and Afghanistan (Operation Iraqi Freedom [OIF], Operation Enduring Freedom [OEF], respectively) have ranged between 12-25% (Hoge et al., 2004; Hoge, Terhakopian, Castro, Messer, & Engel, 2007; Milliken, Auchterlonie, & Hoge, 2007).

A critical consequence of PTSD is its negative impact on functioning. Findings from the NVVRS showed that Vietnam veterans with PTSD had greater work impairment (e.g, unemployment), higher rates of marital problems and divorce, poorer physical health, greater physical limitations, greater rates of violence perpetration, and more medical utilization than those without PTSD (Kulka, 1990; Zatzick et al., 1997). Research has recently begun to document physical and health-related impairments, as well as impairments in behavioral indicators of life functioning, related to trauma exposure and

PTSD symptoms among OIF/OEF veterans. With regard to health impairment, significant associations between PTSD and higher levels of self-reported health symptoms, health-related impairment in day-to-day functioning, health care visits, and work-related absenteeism have been reported (Hoge et al., 2007; Vasterling et al., 2008). In addition, prior exposure to traumatic combat experiences among soldiers about to deploy was found to be associated with increased somatic symptoms (Killgore, Stetz, Castro & Hoge, 2006). Exposure to traumatic experiences during deployment has also been shown to be associated with increased risk taking behavior, alcohol use, and verbal and physical aggression (Killgore et al., 2008).

Recent work examining associations between different clusters of PTSD symptoms and impairment provides initial clues to more specific symptom contributions to impaired health and life functioning. For example, in a sample of treatment-seeking Vietnam veterans, Lunney and Schnurr (2007) examined relations between PTSD symptom clusters and quality of life domains and found a significant relationship between PTSD numbing symptoms and lower overall quality of life. PTSD numbing and avoidance symptoms have been related to lower Global Assessment of Functioning Scale (GAFS) scores (Miller, Wolf, Martin, Kaloupek, & Keane, 2008). Furthermore, PTSD hyperarousal symptoms have been linked to greater aggressive tendencies among male Vietnam veterans (Taft et al., 2007) as well as negative health outcomes among female Vietnam veterans (Kimerling, Clum, & Wolfe, 2000). Among Gulf War I veterans, the numbing *and* hyperarousal clusters were predictive of general distress, depressive and anxious symptomatology, hostility, and somatic symptoms (Thompson et al., 2004).

Although valuable, existing research on PTSD and functional impairment has some limitations. First, studies of OIF / OEF veterans have largely relied on self-report symptom measures. The use of rigorous assessment methodologies (e.g., standardized

clinical interviews) is important to increase confidence in the validity of findings. Second, most studies of OIF / OEF veterans have not explicitly addressed functional impairment, an important index of mental health disability. One study that did examine impairment (Vasterling et al., 2008) focused on impairment related to health outcomes. Third, despite the large volume of research on PTSD among Vietnam War veterans, including its impact on functioning, this research did not begin until many years after veterans returned from the warzone and findings could reflect the cumulative effects of living with PTSD symptoms over many years. Information about functioning soon after return from the warzone is needed to determine how functioning may be affected early on. Finally, most of the existing empirical literature on military--related PTSD has focused on a categorical definition of PTSD. Only limited work has examined associations between continuous measures of PTSD symptoms and corresponding symptom clusters and impairments in functioning.

The purpose of this report was to examine the association between impairment in multiple areas of functioning, overall severity, life satisfaction, and subjective distress and PTSD (diagnosis and symptoms) among OIF / OEF veterans. Our aims were to: 1) examine the association of functional impairment with PTSD diagnosis and symptoms; and 2) examine the more specific associations between PTSD symptom clusters and impairment in different areas of functioning. Based on prior studies, we expected that in addition to PTSD diagnosis, a continuous measure of PTSD symptoms would be associated with poorer outcome on all variables. We further hypothesized that the avoidance / numbing cluster would predict life satisfaction, and that both avoidance / numbing and hyperarousal symptoms would be associated with global measures of impairment and subjective distress.

Method

Participants

Participants were recruited to participate in an ongoing longitudinal study of OEF/OIF National Guard and Reserve veterans that aims to identify risk factors for the onset and maintenance of PTSD and to examine the early course of PTSD symptoms. The target sample for the full study, which is ongoing, is 300. The current report includes 124 participants with data covering a minimum of6months following return from deployment. All returning personnel are eligible to participate, with the exception of psychosis or other conditions characterized by cognitive impairment that would preclude a valid interview. There have been no exclusions for this reason to date.

The 124 participants in the current study included 119 (96%) men and 5 women, with an average age of 34.1 (*SD* = 9.03). In terms of race/ethnicity, 110 (88.7%) participants identified as Caucasian; 7 (5.7%) identified as African American; and 7 (5.7%) identified as other minority groups. Twenty-two (17.7%) identified as Hispanic/Latino. With regard to marital status, 49 (39.5%) were single, 44 (41.1%) were married or living with a partner, 23 (18.6%) were divorced or separated, and 1 was widowed. Most (69.4%) reported some post-high school education, 15 (12.1%) reported graduating from college, and 11 (8.9%) reported holding a post-graduate degree. Most participants (*n* = 115) served in the National Guard (RING); the remaining participants were recruited from the Army, Marine, or Air Force Reserves.

Measures

Clinician-Administered PTSD Scale (CAPS). The CAPS (Blake et al., 1995) is a 30-item structured interview designed to assess the 17 symptoms of PTSD, 8 hypothesized associated features, and global ratings of subjective distress, social impairment, occupational functioning, and global severity. In addition to dichotomous lifetime and current diagnoses of PTSD, it provides a total score based on ratings of frequency and severity for each PTSD symptom. A behaviorally-anchored probe question is provided for each symptom to increase the reliability of administration. In the

current study, we further determined whether symptoms were deployment related, based on the time frame of the trauma exposure / criterion A (during deployment) and timing of symptom onset in relation to the trauma. Administration of the CAPS followed the SCID-I, ensuring that symptoms better explained by Axis I disorders were not rated as PTSD symptoms. Lifetime (predeployment) traumas and associated PTSD symptoms were also assessed and rated; findings reported here include only deployment related symptoms. In the current study the CAPS is administered at the initial assessment and repeated at each follow-up to assess current symptoms. Excellent psychometric data have been reported for this measure, including a sensitivity of .81 and a specificity of .95 for diagnosis (Newman, Kaloupek, & Keane, 1996). Inter-rater reliability for interviewers in the current study was assessed for the CAPS based on 8 audiotaped interviews, each rated by a minimum of 3 interviewers. The intraclass correlation (ICC; Shrout & Fleiss, 1979) for the total PTSD score was .96. ICCs for individual symptom scores ranged from .47 to 1.0 with a median of .94.

Structured Clinical Interview for DSM-IV (SCID-I/P W/PSY Screen). The SCID-I/P (First, Spitzer, Gibbon, & Williams, 1996) is administered at the initial assessment and is used to diagnose current and lifetime Axis I disorders by DSM-IV criteria. The *DSM-IV* version of the SCID-I/P has been shown to have good reliability (e.g. inter-rater Kappa = .63 – 1.0; test-retest Kappa = .44 - .78) among interviewers trained in our department (Zanarini et al., 2000). The SCID-I was administered during the initial assessment.

Longitudinal Interval Follow-up Evaluation (LIFE).

The LIFE (Keller et al., 1987) is a semi-structured interview rating system for assessing the longitudinal course of Axis I mental disorders, and psychosocial functioning. It can be adapted to cover varying time intervals, and has been used for varying intervals ranging from a few months to a one year time period. For Axis I disorders, information is obtained through interview to determine changes in

symptomatic status over the interval covered for all Axis I disorders present, and weekly ratings are generated to reflect the varying symptom status for each disorder. Functioning is similarly assessed over the interval, and includes monthly ratings in multiple areas on separate scales, with ratings typically ranging from 1 (very good) to 5 (very poor). Like the Axis I disorders, psychosocial functioning ratings are generated for the full interval. Ratings for the psychosocial section have demonstrated generally high inter-rater reliability (Keller et al., 1987). In addition to inter-rater and test-retest reliability, our research group has demonstrated reliability of retrospective reporting using a strategy of overlapping recall intervals (Warshaw, Keller, & Stout, 1994).

Global Assessment of Functioning Scale. The Global Assessment of Functioning Scale (GAFS) rating is also completed as part of the LIFE psychosocial section. The GAFS (APA, 2000) is a rating based on the interviewer's judgment of psychosocial functioning and symptom severity. Scores range from 1 (worst) to 100 (best), with descriptive anchors provided for each 10-point block. The GAFS has been used in relevant prior work as an applicable index of functioning that is consonant with functional assessments conducted by Veterans Affairs (e.g., Miller et al., 2008). Ratings for month 1 and month 6 following return from deployment are used in the current report.

Procedure

Participants were recruited directly from returning National Guard / Reserve units, primarily at the initial or follow-up Post Deployment Health Assessment (PDHA) or Re-assessment (PDHRA) debriefings, between December 2006 and November 2007. A brief description of the study was presented, and brochures describing the study were provided. Contact information was obtained at the PDHA / PDHRA for those individuals who expressed interest and gave permission to be contacted; interested individuals were then contacted by phone to schedule an interview. We were able to present the study to an average of about 67% of military personnel returning from the units approached.

About 66% of those hearing about the study agreed to be contacted, and about 70% of those participated in the study. Of the latter, some were not scheduled due to limits of interviewer time. Excluding the number not interviewed due to our time restraints, our response rate was about 55%. Participants were given a chance to ask questions and provided informed consent prior to the initial interview.

Participants underwent comprehensive assessments including evaluation of lifetime and current PTSD and other Axis I disorders; psychosocial functioning; any prior or current psychiatric treatment received; and a range of measures assessing hypothesized risk factors. Table 1 summarizes the measures used in the current report. The CAPS (Blake et al., 1995) was the primary measure of PTSD and associated symptoms, and was used to assess lifetime and current (past month) PTSD. CAPS data for the current report includes ratings for month 1 and month 6 following return from deployment. Additional psychiatric disorders (lifetime and current) were assessed by the SCID-I at the initial interview and by the LIFE at follow-up interviews. Participants not on active duty status were paid $80 for completion of each interview. All participants were interviewed by one of 4 experienced interviewers (masters degree or a minimum of two years of diagnostic experience). Interviewers received extensive training to administer the SCID, LIFE, and CAPS by experienced members of the Clinical Assessment and Training Unit (CATU) at Brown University.

The study design calls for an initial (baseline) assessment as soon as can be arranged following return from deployment, and follow-up assessments at 6, 12, and 24 months post-return. As described below, if the initial assessment occurred at 6 months, the baseline and 6 month assessments were combined (see table 1 for timing of data collection). Recruitment occurs in waves associated with return dates for various units, and scheduling and completing interviews for all participants recruited from a given unit can take several months. Due to IRB delays and the timing of returning units,

fecruitment for the first two returning units (which includes the majority of the current sample) did not begin until months after return; as a result, the number of days between return and assessment dates for the current sample ranged from 11 to 309, with an average of 182. For participants who had been home for 6 months or longer by the time of the first assessment (65% of the current sample), information for both the baseline assessment and for the interval between the date of return and the date of the assessment were obtained in one, rather than two, assessments. The remaining 35% had two separate interviews. Regardless of when the first interview took place, information was obtained to rate the CAPS for the first month post-return, thus the baseline CAPS reflects the first month post-return for all participants. For interviews conducted later than 6 months, the CAPS was based on the actual previous month; for a minority of participants, the 6 months CAPS thus reflects symptom status a few months beyond the 6 month point. As described above, the LIFE generates monthly ratings for the psychosocial functioning ratings, including the GAFS. Ratings for the same months as the CAPS (month 1 and approximately month 6) were used for the psychosocial variables.

Data Analysis

Two sets of cross-sectional analyses were conducted; using the month1and month6post-return ratings for the independent and dependent variables. Independent variables included the PTSD diagnosis, PTSD total symptom severity score, and PTSD symptom cluster scores from the CAPS as the independent variables. Dependent variables included four CAPS ratings (subjective distress, social impairment, occupational functioning, and global severity), the GAFS, and three scales from the LIFE (global social adjustment, relationships with friends, and life satisfaction). Analyses of Covariance were conducted to compare those with and without PTSD on the dependent variables. Linear model regression analyses were conducted to examine the association

of the CAPS continuous measure of PTSD symptom severity with the dependent variables. For all analyses, the independent variables and the covariates were entered simultaneously, and findings reflect the unique contribution of each variable controlling for all others in the model. Covariates included age, race, the presence of any Axis I disorder (other than PTSD), and to control for possible effects from retrospective reporting, the number of days between the date of return from deployment and the date of the interview. Due to the small number of women in the current sample (n=5), gender was not included as a covariate. Linear model regression analyses were conducted to examine the unique associations of the three PTSD symptom clusters with the dependent variables, including the same covariates as above. To control for family-wise error rate, a partial bonferroni correction was applied with an alpha level of .01 for statistical significance, although probabilities of < .05 are noted. Data analyses were conducted using SAS software (SAS Institute Inc., 2001).

Results

Eighteen participants (14.5%) met full criteria for PTSD related to deployment experiences during the first month after return. Most participants (85%) had at least one deployment-related PTSD symptom (moderate or worse severity), 56% had at least 3, and 28% had 5 or more. Symptoms of hyperarousal were the most common. Specifically, many participants reported hypervigilance (56%), exaggerated startle (48%), difficulty falling or staying asleep (49%), and irritability and anger (48%). Forty-two participants met criteria for an Axis I disorder other than PTSD. The 42 included 18 (100%) of those with PTSD, and 24 (23%) of those without PTSD. The most frequent Axis I disorder other than PTSD was Major Depressive Disorder (MDD); affecting 9 (50%) of the PTSD participants and 6 (6%) of those without PTSD. Eight had an additional anxiety disorder (11% and 6% of those with and without PTSD), and 11 met

criteria for alcohol abuse or dependence (17% of those with and 8% of those without PTSD).

PTSD symptom severity and Impairment

Table 2 summarizes the results of the Analyses of Covariance comparing those with and without PTSD. All models were significant ($p < .01$). PTSD diagnosis was a unique predictor of all but one of the dependent variables (relationship with friends).

Results of the linear regression analyses (not shown) examining the association of the CAPS total score were similar. All models were significant, and the CAPS total score significantly predicted all measures with the exception of relationship with friends.

Figure 1 shows the distribution of participants by GAFS score and number of PTSD symptoms. As expected, those with PTSD have lower GAFS, but many of the participants without a PTSD diagnosis have GAFS reflecting impairment. Since the GAFS rating reflects symptoms and impairment associated with any Axis I disorder, the level of impairment cannot be solely attributed to PTSD symptoms. Nonetheless, the graph illustrates the strong association between the GAFS and the number of PTSD symptoms.

PTSD symptom clusters and functioning. Table 3 summarizes findings from linear regression analyses entering each of the three PTSD symptom cluster scores and the covariates simultaneously at each time point. All models were significant, and findings were again highly consistent. Re-experiencing symptoms were not associated with any of the impairment or severity measures, at either time point. The hyperarousal symptom cluster was significantly associated with the CAPS rating of subjective distress and global severity, and the GAFS. The avoidance / numbing cluster significantly predicted the CAPS social impairment, occupational functioning, and global severity rating, and the LIFE global social adjustment, relationship with friends, and life satisfaction scales at either one or both time points.

Discussion

The present investigation examined associations between PTSD (diagnosis and symptoms) and functional impairment, severity, and distress among OIF / OEF veterans. Both PTSD diagnosis and total symptom severity score were consistently associated with worse outcome in all of these areas, while controlling for age, race, number of days since return, and presence of additional Axis I Disorders. Findings from the first month after return from deployment were highly consistent with findings at month 6. These findings are consistent with research showing that PTSD is associated with a negative impact on functioning and quality of life. The current findings show, additionally, that these effects are present even when the presence of additional Axis I disorders is accounted for.

Examination of the unique contribution of each of the 3 PTSD symptom clusters also showed consistent patterns at both time points. Re-experiencing symptoms, as in previous studies (e.g., Lunney & Schnurr, 2007; Miller et al., 2008), were not uniquely associated with any measures of impairment or distress. Thus while re-experiencing symptoms may be critical as indicators of PTSD, they do not appear to play as important a role as the other symptom clusters in the life impact of PTSD. Consistent with prior studies (e.g., Lunney & Schnurr, 2007; Miller et al., 2008), the symptom cluster of numbing / avoidance was significantly associated with higher global severity (month 1) and with less satisfaction with life (month 6), although not uniquely associated with subjective distress. In addition, numbing / avoidance symptoms were uniquely predictive of several indices of interpersonal functioning, including two measures of global social impairment (CAPS item and the LIFE scale), and relationships with friends. Numbing / avoidance symptoms also uniquely predicted the CAPS occupational functioning rating, which in addition to job functioning includes parental functioning. The specific importance of numbing symptoms to interpersonal impairment has also been reported in

a study investigating the differential pattern of associations between the PTSD symptom clusters and interpersonal functioning in Vietnam veteran fathers: only the emotional numbing cluster was associated with poorer perceived relationships with their children (Ruscio, Weathers, King, and King, 2002).

In contrast to our findings for numbing / avoidance symptoms, hyperarousal symptoms were the strongest predictors of overall functioning, global severity, and subjective distress, suggesting that different aspects of outcome are affected by different symptom clusters. Symptoms of numbing and emotional detachment might be expected to have the most direct negative impact on relationships via their influence on emotional connection (e.g., inability to experience emotions, decreased emotional disclosure and openness) with others. It will be of interest to examine more specific aspects of social functioning including marital and parental relationships when our sample size has increased. Symptoms of hyperarousal, including difficulty sleeping, difficulty concentrating, and irritability and anger, might be expected to have a stronger impact on ability to focus and maintain attention, complete tasks, and successfully work with others, thus contributing to poorer overall functioning. Persisting experiences of fatigue, difficulty concentrating, being constantly on edge, and feelings and outburst of anger may explain the strong associations with subjective distress.

The results also show that most participants reported some symptoms of posttraumatic stress of at least moderate severity and further, as in prior studies (e.g. Marshall et al., 2001) that impairment (assessed by the GAFS) associated with PTSD symptoms appears to be continuous rather than categorical. Other research has supported a dimensional conceptualization of posttraumatic stress reactions on the basis of taxometric procedures (e.g. Forbes, Haslam, Williams, & Creamer, 2005) and some (e.g. Broman-Fulks et al., 2009) have argued that reliance on a categorical diagnosis of PTSD results in the loss of important information, and its use in determining need for

psychological services is limited. The question of whether the presence of such symptoms should be targeted for early intervention to prevent the development of full blown PTSD as some suggest (e.g. Litz and Maguen, 2007) remains unclear. Guidance on this question will come from further data on the course of such symptoms and associated impairment.

While the present study has important strengths, including the comprehensive interview based assessments, there are also limitations. First, the timing of assessments of our first cohort of participants resulted in the need to rely on retrospective reporting for information on the months immediately following return from deployment. Second, as in several other studies of OIF / OEF veterans, the small number of women in the sample precludes examination of possible gender differences. Third, it is unclear if the findings generalize to active duty forces. Fourth, without pre-deployment assessment, impairment in functioning cannot be entirely attributed to deployment experiences. Finally, the data presented here are based on a relatively small sample.

In summary the present investigation provided data regarding associations between posttraumatic stress symptoms and impairment, across a variety of functional domains, over a 6-month time-frame following return from deployment in OEF / OIF veterans The findings are consistent with earlier studies showing the association between PTSD and poorer psychosocial functioning, and support earlier reports of impairment associated with symptoms below the diagnostic threshold for PTSD. Novel findings include the differential associations between PTSD symptom clusters and specific areas of functioning and distress. Completion of 12 and 24 month follow-ups in the final sample of this study will allow us to examine relations between posttraumatic stress symptoms and functioning in a larger sample over longer periods of time.

References

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Washington, DC: Author.

Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, G., Gusman, F. D., Charney, D. S., & Keane T.M. (1995). The development of a clinician-administered PTSD scale. *Journal of Traumatic Stress, 8*, 75-90.

Broman-Fulks, J. J., Ruggiero, K. J., Green, B. A., Smith, D. W., Hanson, R. F., Kilpatrick, D. G., & Saunders, B. E. (2009). The latent structure of posttraumatic stress disorder among adolescents. *Journal of Traumatic Stress*, *22*, 146-152.

Dohrenwend, B. P., Turner, J. B., Turse, N. A., Adams, B. G., Koenen, K. C., et al. (2006). The psychological risks of Vietnam for U.S. veterans: a revisit with new data and methods*. Science, 313*, 979-982.

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1996). Structured Clinical Interview for DSM-IV Axis I Disorders, Patient Edition (SCID-I/P). *. New York, NY New York State Psychiatric Institute, Biometrics Research.*

Forbes, D., Haslam, N., Williams, B. J., & Creamer, M. (2005). Testing the latent structure of posttraumatic stress disorder: A taxometric study of combat veterans. *Journal of Traumatic Stress*, *18*, 647-656.

Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., & Koffman, R. L. (2004). Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care*. New England Journal of Medicine, 351*, 13-22.

Hoge, C. W., Terhakopian, A., Castro, C. A., Messer, S. C., & Engel, C. C. (2007). Association of posttraumatic stress disorder with somatic symptoms, health care visits, and absenteeism among Iraq war veterans. *American Journal of Psychiatry, 164*, 150-153.

Keller, M. B., Lavori, P. W., Friedman, B., Nielsen, E., Endicott, J., et al. (1987). The Longitudinal Interval Follow-up Evaluation. A comprehensive method for assessing outcome in prospective longitudinal studies*. Archives of General Psychiatry, 44*, 540-548.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, *52*, 1048-1060.

Killgore, W. D., Stetz, M. C., Castro, C. A., & Hoge, C. W. (2006). The effects of prior combat experience on the expression of somatic and affective symptoms in deploying soldiers. *Journal of Psychosomatic Research, 60*, 379-385.

Killgore, W. D., Cotting, D. I., Thomas, J. L., Cox, A. L., McGurk, D., Vo, A. H., et al. (2008). Post-combat invincibility: violent combat experiences are associated with increased risk-taking propensity following deployment. *Journal of Psychiatric Research, 42*, 1112-1121.

Kimerling, R., Clum, G. A., & Wolfe, J. (2000). Relationships among trauma exposure, chronic posttraumatic stress disorder symptoms, and self-reported health in women: Replication and extension. *Journal of Traumatic Stress, 13*, 115-128.

Kulka, R. A. (1990). *Trauma and the Vietnam War Generation: Report of Findings from the National Vietnam Veterans Readjustment Study*. Brunner/Mazel.

Litz, B. T., & Maguen, S. (2007). Early intervention for trauma. In M. J. Friedman, B. T. Litz & P. A. Resick (Eds.), *Handbook of PTSD: Science and practice.* (pp. 306-329). New York, NY US: Guilford Press.

Lunney, C. A., & Schnurr, P. P. (2007). Domains of quality of life and symptoms in male veterans treated for posttraumatic stress disorder. *Journal of Traumatic Stress, 20*, 955-964.

Marshall, R. D., Olfson, M., Hellman, F. Blanco, C., Guardino, M., & Struening, E. L. (2001). Comorbidity, impairment, and suicidality in subthreshold PTSD. *American Journal of Psychiatry*, *158*, 1467-1473.

Miller, M. W., Wolf, E. J., Martin, E., Kaloupek, D. G., & Keane, T. M. (2008). Structural equation modeling of associations among combat exposure, PTSD symptom clusters, and Global Assessment of Functioning. *Journal of Rehabilitation, Research, and Development, 45*, 359-370.

Milliken, C. S., Auchterlonie, J. L., & Hoge, C. W. (2007). Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war*. Journal of the American Medical Association, 298*, 2141-2148.

Newman, E., Kaloupek, D. G., & Keane, T. M. (1996). Assessment of posttraumatic stress disorder in clinical and research settings*. Traumatic stress: The effects of overwhelming experience on mind, body, and society*: 242-275.

Ruscio, A. M., Weathers, F. W., King, L. A., & King, D. W. (2002). Male war-zone veterans' perceived relationships with their children: the importance of emotional numbing. *Journal of Traumatic Stress*, *15*, 351-357.

SAS Institute, Inc. (2001). SAS software [Version 8.2]. Cary, NC.

Shelby, R. A., Golden-Kreutz, D. M., & Andersen, B. L. (2008). PTSD diagnoses, subsyndromal symptoms, and comorbidities contribute to impairments for breast cancer survivors. *Journal of Traumatic Stress, 21*, 165-172.

Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin*, *86*, 420-428.

Taft, C. T., Kaloupek, D. G., Schumm, J. A., Marshall, A. D., Panuzio, J., King, D. W., & Keane, T. M. (2007). Posttraumatic stress disorder symptoms, physiological reactivity, alcohol problems, and aggression among military veterans. *Journal of Abnormal Psychology, 116*, 498-507.

Thompson, K. E., Vasterling, J. J., Benotsch, E. G., Brailey, K., Constans, J., Uddo, M., & Sutker, P. B. (2004). Early symptom predictors of chronic distress in Gulf War veterans. *Journal of Nervous and Mental Disease, 192*, 146-152.

Vasterling, J. J., Schumm, J., Proctor, S. P., Gentry, E., King, D., & King, L. (2008). Posttraumatic stress disorder and health functioning in a non-treatment-seeking sample of Iraq war veterans: A prospective analysis. *Journal of Rehabilitation Research and Development, 45,* 347-358.

Warshaw, M. G., Keller, M. B., & Stout, R. L. (1994). Reliability and validity of the longitudinal interval follow-up evaluation for assessing outcome of anxiety disorders*. Journal of Psychiatric Research, 28*, 531-45.

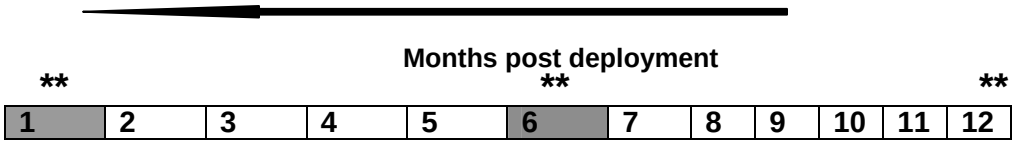
Zanarini, M. C., Skodol, A. E., Bender, D., Dolan, R., Sanislow, C., Schaefer, E., Morey, L. C.,

Grilo, C. M., Shea, M. T., McGlashan, T. H. & Gunderson, J. G. (2000). The Collaborative Longitudinal Personality Disorders Study: Reliability of Axis I and II diagnoses. *Journal of Personality Disorders, 14*, 291-299.

Zatzick, D. F., Marmar, C. R., Weiss, D. S., Browner, W. S., Metzler, T. J., Golding, J. M., et al. (1997). Posttraumatic stress disorder and functioning and quality of life outcomes in a nationally representative sample of male Vietnam veterans. American Journal of Psychiatry, 154, 1690-1695.

Table 1: Assessment Measures and Timing

	Baseline	Foll up
Symptom and functioning measures		
SCID (Interview -I)	X	
CAPS (I)	X	X
LIFE psychosocial ratings and GAFS	X	X
LIFE Axis I ratings		X



** Interview target months (1 = baseline, 6 and 12 = follow-up)

Arrow indicates 1) range of time initial interview conducted, and 2) information retrospectively assessed from interview point

Shaded blocks indicate months used in analyses

Table 2: Analyses of Covariance: Functioning and Severity Measures by PTSD Diagnosis

Note: CAPS refers to Clinician Administered PTSD Scale; LIFE refers to Longitudinal Interval Follow-up Evaluation; GAFS refers to Global Assessment of Functioning Scale.
*p < .05. **p < .01. ***p < .001.

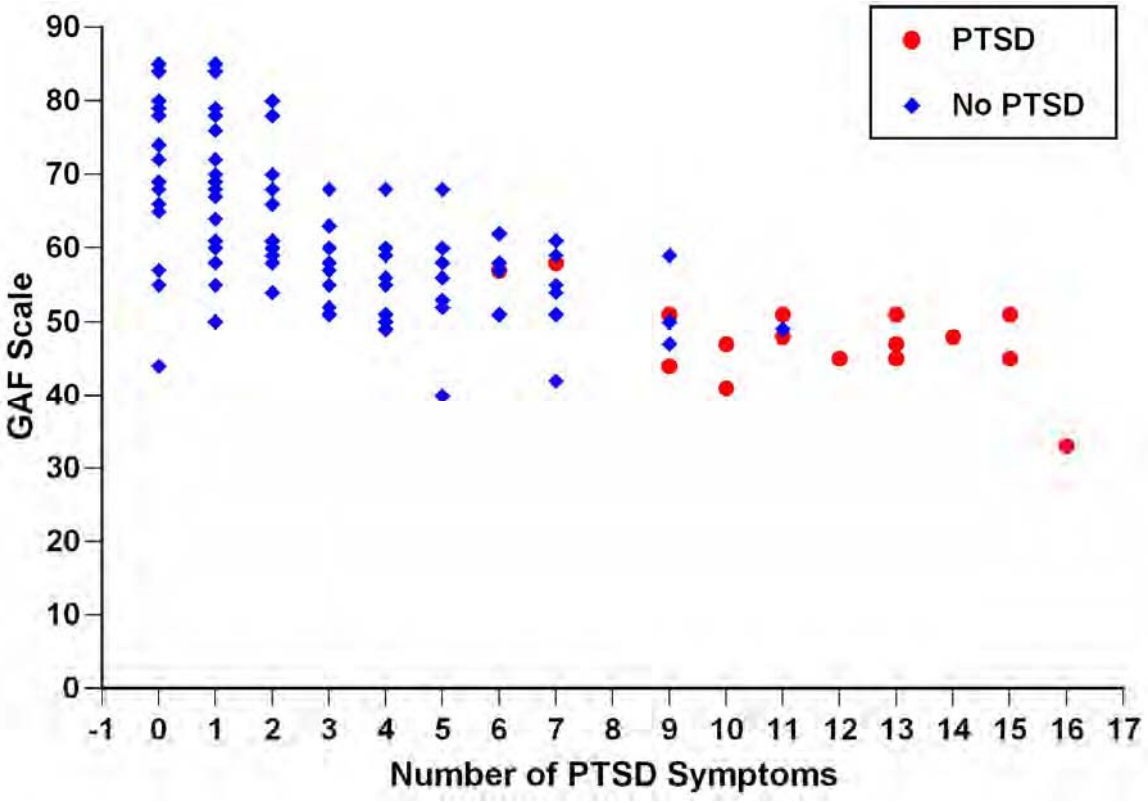
	Month 1			Month 6	
	R^2	F (model)	F	R^2 F (model)	F
CAPS Subjective Distress	.32	10.88***		.34 12.07***	
Age			0.53		2.71
Race (white)			0.05		0.49
Days Since Return			0.86		0.56
Axis I			8.58**		2.66
PTSD			19.96***		37.47***
CAPS Social Impairment	.27	8.65***		.42 16.62***	
Age			0.24		0.24
Race			0.01		1.05
Days Since Return			0.96		5.64*
Axis I			6.85**		7.87**
PTSD			16.08***		50.71***
CAPS Occupational Functioning	.44	18.52***		.39 14.64***	
Age			6.51*		5.88*
Race			0.12		2.41
Days Since Return			0.29		0.03
Axis I			11.00**		3.49
PTSD			30.9***		44.39***
CAPS Global Severity	.31	10.56***		.34 12.12***	
Age			1.24		4.40*
Race			0.02		0.05
Days Since Return			0.01		0.37
Axis I			7.20**		4.54*
PTSD			19.31***		33.75***
LIFE Friends	0.11	3.02*	.	.15 3.97**	
Age			6.01*		4.59*
Race			1.45		2.86
Days Since Return			1.49		0.68
Axis I			2.23		4.90*
PTSD			0.06		1.15
LIFE Global Social Adjustment	.30.	10.07***		.38 14.0***	
Age			5.65*		5.62*
Race			2.49		8.79**
Days Since Return			0.17		1.19
Axis I			6.79**		17.85***
PTSD			13.27***		16.91**
LIFE Satisfaction	.22	6.79***		.28 9.04***	
Age			1.59		3.49
Race			2.48		6.27*
Days Since Return			0.09		3.65
Axis I			7.04**		7.68**
PTSD			8.15**		14.62***
GAFS	.34	11.82***		.36 13.05***	
Age			0.28		4.27*
Race			0.00		0.20
Days Since Return			0.27		0.70
Axis I			19.40***		18.33***
PTSD			11.41***		19.08***

Table 3: Linear Regression Analyses: CAPS cluster scores predicting impairment/severity scores.

	Month 1				Month 6			
	R^2	*B*	*SE B*	β	R^2	*B*	*SE B*	β
Subjective Distress	.573***				.621***			
Axis I		.12	.14	.06		-.01	.13	-.00
Re-experience		.02	.01	.12		.01	.01	.08
Avoid / numb		.01	.01	.10		.03	.01	.22*
Hyperarousal		.06	.01	.58***		.05	.01	.55***
Social Impairment	.439***				.489***			
Axis I		.14	.17	.07		.26	.15	.13
Re-experience		01	.01	.05		.02	.01	.18
Avoid / numb		.06	.01	.52***		.05	.01	.44***
Hyperarousal		.01	.01	.14		.01	.01	.10
Occupational Functioning	.489***				.434***			
Axis I		.31	.14	.17*		.14	.13	.08
Re-experience		.00	.01	.01		-.01	.01	-.07
Avoid / numb		.04	.01	.43***		.05	.01	.49***
Hyperarousal		.02	.01	.17		.02	.01	.23*
Global Severity	.604***				.577***			
Axis I		-.00	.13	-.00		.08	.13	.04
Re-experience		.02	.01	.14		.01	.01	.10
Avoid / numb		.03	.01	.27**		.02	.01	.23*
Hyperarousal		.04	.01	.48***		.04	.01	.48***
Relationships w/ Friends	.100**				.152***			
Axis I		.25	.27	.10		.47	.24	.18
Re-experience		-.03	.02	-.18		-.02	.02	-.19
Avoid / numb		.03	.02	.19		.05	.02	.37**
Hyperarousal		.02	.01	.12		-.00	.02	-.01
Global Social Adjustment	.335***				.454***			
Axis I		.28	.18	.14		.57	.16	.27***
Re-experience		-.00	.01	-.03		-.02	.02	-.19
Avoid / numb		.04	.01	.34**		.05	.01	.42***
Hyperarousal		.02	.01	.19		.03	.01	.25*
Satisfaction	.199***				.386***			
Axis I		.46	.22	.20*		.35	.18	.15
Re-experience		-.00	.02	-.00		-.01	.02	-.06
Avoid / numb		.31	.01	.26*		.07	.01	.55***
Hyperarousal		.01	.01	.09		.00	.01	.03
GAFS	.517***				.569***			
Axis I		-4.66	1.76	-.20**		-5.66	1.65	-.23***
Re-experience		-.04	.14	-.03		.09	.16	.06
Avoid / numb		-.20	.11	-.16		-.22	.13	-.16
Hyperarousal		-.52	.10	-.48***		-.65	.11	-.55***

Note: Additional covariates included age, race, and number of days between return and assessment dates. Number of days since return significant for month 6 social impairment and satisfaction, and race significant for month 6 global social adjustment and satisfaction. CAPS = Clinician Administered PTSD Scale; LIFE = Longitudinal Interval Follow-up Evaluation; GAFS = Global Assessment of Functioning Scale.

* $p < .05$. ** $p < .01$. *** $p < .001$


PTSD
No PTSD
GAF Scale
90
80
70
60
50
40
30
20
10
0
-1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Number of PTSD Symptoms